

(12) PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 199854443 B2**
(10) Patent No. **732370**

(54) Title
Electronic article surveillance label cartridge and system

(51)⁶ International Patent Classification(s)
B65D 085/62 B65D 085/30
A47F 003/02

(21) Application No: **199854443** (22) Application Date: **1997.11.14**

(87) WIPO No: **WO98/21124**

(30) Priority Data

(31) Number (32) Date (33) Country
08/749437 1996.11.15 US

(43) Publication Date : **1998.06.03**
(43) Publication Journal Date : **1998.07.30**
(44) Accepted Journal Date : **2001.04.26**

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(56) Related Art
US 4510489
US 4365709
GB 2053855

OPI: DATE 03/06/98 APPLN. ID 54443/98
AOJP DATE 30/07/98 PCT NUMBER PCT/US97/21056



AU9854443

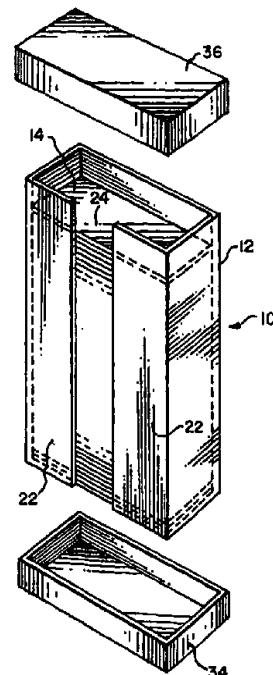
(51) International Patent Classification 6 : B65D 85/62, 85/30, A47F 3/02		A1	(11) International Publication Number: WO 98/21124
			(43) International Publication Date: 22 May 1998 (22.05.98)
(21) International Application Number: PCT/US97/21056		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 14 November 1997 (14.11.97)		Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(30) Priority Data: 08/749,437 15 November 1996 (15.11.96) US			
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(54) Title: ELECTRONIC ARTICLE SURVEILLANCE LABEL CARTRIDGE AND SYSTEM

(57) Abstract

A cartridge (12) for electronic article surveillance labels (14) comprising a housing shaped to hold a plurality of electronic article surveillance labels (14) in a stack such that the electronic article surveillance labels (14) can be removed individually from a first side of the housing and a system (10) utilizing such housing and a plurality of electronic article surveillance labels (14) that are at least semirigid.



ELECTRONIC ARTICLE SURVEILLANCE LABEL CARTRIDGE AND SYSTEM**5 FIELD OF THE INVENTION**

This invention relates to electronic article surveillance and, more particularly, to an electronic article surveillance label cartridge and an electronic article surveillance label cartridge system.

BACKGROUND OF THE INVENTION

10 Electronic article surveillance systems have employed either reusable or disposable electronic article surveillance labels to protect goods from pilferage. The reusable labels are normally placed on the goods at the commercial establishment by a clerk and are removed from the goods by the clerk with a special tool before the customer exits the store. The label is then reused by having the clerk place the label on another article. The disposable labels are
15 generally attached to the packaging by adhesive. These labels are formed in a line on a liner or backing which acts as a carrier for the labels which have a pressure sensitive adhesive. The liner is then wound onto a core to form a roll which is shipped to the commercial establishment. The roll of labels is loaded into a dispenser which detaches individual labels from the roll that are applied to the goods that are to be protected by the electronic article
20 surveillance system. Numerous retail chains and manufacturers desire to facilitate the protection of their goods by source tagging, that is, where the task of protecting the goods with electronic article surveillance labels is performed during manufacture and packaging of the goods rather than at the retail level.

The current method of applying electronic article surveillance labels by stripping them
25 from the liner and applying them to the goods with a dispenser limits the application speed. The roll format also requires rethreading of the dispenser when a new roll is installed which further decreases the overall throughput. In addition, the liner and necessary dead space between the labels in the rolls increases the space required for storing a given label count at the manufacturing facility. The source tagging environment requires a label system that
30 facilitates higher application speeds than available with current application systems and reduces the amount of plant floor requirements for storing the labels.

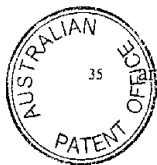
SUMMARY OF THE INVENTION

In accordance with a first aspect of the invention, there is disclosed a cartridge for holding rectangular electronic article surveillance labels in a stack, the cartridge comprising:

- 5 a first side having an aperture so that the electronic article surveillance labels can be removed serially from the cartridge;
- second and third straight sides that are sized to accommodate the largest dimension of the electronic article surveillance labels;
- fourth and fifth straight sides that are sized to accommodate the second largest
10 dimension of the electronic article surveillance labels; and
- a sixth side opposite the first side, the sixth side having an aperture, the second side contacting the fourth side to form a first interior angle, the second side contacting the fifth side to form a second interior angle, the third side contacting the fourth side to form a third interior angle and the third side contacting the fifth side to form a fourth interior
15 angle, wherein one of the second, third, fourth, and fifth sides has a slot from the first side to the sixth side, thereby dividing the side having the slot into two pieces, and wherein at least one of the first, second, third, and fourth interior angles is greater than ninety degrees.

- In accordance with a second aspect of the invention, there is disclosed an
20 electronic article surveillance label cartridge system comprising: a plurality of electronic article surveillance labels that are at least semirigid and a cartridge shaped to hold the electronic article surveillance labels in a stack, the cartridge having a first side with an aperture sized so that the electronic article surveillance labels can be removed serially from the cartridge, second and third sides that are sized to accommodate the largest
25 dimension of the electronic article surveillance labels, fourth and fifth sides that are sized to accommodate the second largest dimension of the electronic article surveillance labels and a sixth side opposite the first side, the sixth side having an aperture, the second side contacts the fourth side to form a first interior angle, the second side contacts the fifth side to form a second interior angle, the third side contacts the fourth side to form a third
30 interior angle and the third side contacts the fifth side to form a fourth interior angle, wherein one of the second, third, fourth, and fifth sides has a slot from the first side to the sixth side, thereby dividing the side having the slot into two pieces, and wherein at least one of the first, second, third, and fourth interior angles is greater than ninety degrees.

- In accordance with a third aspect of the invention, there is disclosed an electronic
35 article surveillance label cartridge system comprising: a plurality of electronic article



surveillance labels that are at least semirigid and a cartridge shaped to hold the electronic article surveillance labels in a stack, the cartridge having a first side with an aperture sized so that the electronic article surveillance labels can be removed serially from the cartridge, second and third sides that are sized to accommodate the largest dimension of the electronic article surveillance labels, fourth and fifth sides that are sized to accommodate the second largest dimension of the electronic article surveillance labels so that the electronic article surveillance labels in the stack will fall out of the cartridge one after the other when the cartridge is positioned such that the first side is at the bottom of the cartridge, and sixth side opposite the first side, the sixth side having an aperture, the second side contacts the fourth side to form a first interior angle, the second side contacts the fifth side to form a second interior angle, the third side contacts the fourth side to form a third interior angle and the third side contacts the fifth side to form a fourth interior angle, wherein one of the second, third, fourth, and fifth sides has a slot from the first side to the sixth side, thereby dividing the side having the slot into two pieces, and wherein at least one of the first, second, third, and fourth interior angles is greater than ninety degrees.

DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a preferred embodiment of the electronic article surveillance label cartridge system of the present invention.

Fig. 2 is a front view of the cartridge shown in Fig. 1.

Fig. 3 is a back view of the cartridge shown in Fig. 1.

Fig. 4 is a left side view of the cartridge shown in Fig. 1.

Fig. 5 is a right side view of the cartridge shown in Fig. 1.

Fig. 6 is a bottom view of the cartridge shown in Fig. 1.

Fig. 7 is a top view of the cartridge shown in Fig. 1.

Fig. 8 is a top view of an alternative embodiment of the cartridge shown in Fig. 1.

Fig. 9 is a perspective view of a preferred embodiment of an electronic article surveillance label utilized in the electronic article surveillance label cartridge system of the present invention.



Fig. 10 is a perspective view of an alternative embodiment of an electronic article surveillance label utilized in the electronic article surveillance label cartridge system of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

5 Referring to Figs. 1 through 8, an electronic article surveillance (EAS) label cartridge system of the present invention is shown generally by numeral 10 and includes a cartridge 12, which can be a sleeve or housing, and a plurality of electronic article surveillance (EAS) labels 14 which are held inside cartridge 12 in a stack. Only a few of the plurality of EAS labels 14 in the stack have been shown at the top and bottom of the stack with the remainder
10 being indicated by dashed and dotted lines for the sake of clarity in the drawing. Cartridge 12 has side walls 16 and 18, back wall 20, and front wall 22. Side walls 16 and 18 and back wall 20 are solid. Front wall 22 can be solid like back wall 20, or it can have a slot 24. Back wall 20 and front wall 22 are sized so that they are slightly larger than the largest dimension of EAS labels 14. Side walls 16 and 18 are sized so that they are slightly larger than the second
15 largest dimension of EAS labels 14 so that EAS labels 14 are stacked in the direction of the smallest dimension of EAS labels 14. Bottom side 26 of cartridge 12 has an aperture 28 that is slightly larger than the dimensions of EAS labels 14 as described above in relation to side walls 16 and 18, back wall 20 and front wall 22 so that when EAS labels 14 are stacked in cartridge 12 and cartridge 12 is turned so that bottom side 26 is at the bottom of cartridge 12,
20 EAS labels 14 will fall out of cartridge 12 one after the other. Top side 30 can have an aperture 32 which can be sized similarly to aperture 28 in bottom side 26, or alternatively it can be solid as shown in Fig. 8. In addition, the interior angles, a, b, c, and d, formed by side walls 16 and 18, back wall 20, and front wall 22 have been shown as being ninety degrees; however, one or more, and preferably all, of the angles can be made greater than ninety
25 degrees to ensure that EAS labels 14 do not get caught in the corners.

Slot 24 in front wall 22 can be sized to allow access to EAS labels 14 by means of a tool or even a person's finger in the event that EAS labels 14 stick inside cartridge 12. Although slot 24 has been shown as being located in front wall 22, it should be understood that alternatively it could be located in back wall 20 or side walls 16 and 18. Still further,
30 more than one slot 24 could be located on one or more of side walls 16 and 18, back wall 20, and front wall 22. In addition, slot 24 can function in combination with aperture 32 in top

side 30 to allow a member (not shown) from an application tool to apply pressure on EAS labels 14 thereby pushing them out of aperture 28 in bottom side 26 at a controlled rate. In this embodiment aperture 32 and slot 24 can be similarly sized if the tool member is merely rectangular. However, if the end part of the member that would be located inside cartridge 12 and resting against EAS labels 14 is larger than slot 24, then aperture 32 is sized to accommodate the end part and ideally is sized similarly to aperture 28 as shown in Fig. 7.

Cartridge 12 can be made of plastic or other suitable material such as paper, wood, or metal. In any event cartridge 12 must have sufficient rigidity to prevent the twisting and negative torque effect resulting from application pressure applied at the bottom of the stack.

In addition, cartridge 12 provides protection of EAS labels 14.

EAS label cartridge system 10 also can include end caps 34 and 36 which are sized to fit over cartridge 12 to hold EAS labels 14 inside cartridge 12. Other arrangements can be utilized to keep EAS labels 14 inside cartridge 12, and the embodiment shown in Fig. 1 for caps 34 and 36 is merely exemplary.

Referring to Fig. 9, a preferred embodiment of EAS labels 14 for use with EAS label cartridge system 10 is shown generally by numeral 38. EAS label 38 is a specially designed magnetomechanical EAS label that is similar to the magnetomechanical EAS labels sold by the assignee of this application under the brand name "ULTRA•MAX®"; such EAS labels provide excellent performance and are used widely for theft deterrence. EAS label 38 has a housing 40 that has a cavity 42 and a lip 44. Housing 40 is at least semirigid and can be rigid such that it can be pushed from one end under the pressure of the stack and any application tool without flexing or sustaining damage. Magnetic element 46, which mechanically vibrates at a predetermined frequency in response to an interrogation field as taught in U.S. Patent No. 4,510,490, is positioned inside cavity 42. Film 48 is positioned on lip 44 and sealed thereto. Magnetic element 50, which is a semi-hard or hard magnetic element that biases magnetic element 46 is placed on film 48. Film 52 is then positioned on top of film 48 and magnetic element 50 and is sealed at lip 44. Housing 40 and films 48 and 52 can be constructed of a plastic material suitable for heat sealing such as polyethylene, or for radio frequency welding such as polyvinylchloride. EAS label 38 can be hermetically sealed and constructed of a Food and Drug Administration (FDA) approved material to be suitable for contact with food or pharmaceutical products. Some examples of FDA approved material are

as follows: generally plastics and cellophanes and more specifically polyethylene, polypropylene, polyvinylchloride, polyethylene-terephthalate, nylon, polyester, polystyrene and ionomer. It should also be understood that a similar housing could be used to accommodate a radio frequency identification tag rather than the magnetic elements described
5 hereinabove in relation to EAS label 38.

An alternative embodiment of EAS labels 14 that can be utilized with EAS label cartridge system 10 is indicated generally by numeral 54. EAS label 54 has a substrate 56 which has a stiffness that ranges from semirigid to rigid such that it can be pushed from one end under the pressure of the stack and any application tool without flexing or sustaining
10 damage. Substrate 56 can be made of the material described above in relation to EAS label 38. EAS element 60 is positioned on carrier 58, which can be a thin film with an adhesive on one or both sides for holding EAS element 60 on carrier 58 and/or carrier 58 on substrate 56. Other means of attaching EAS element 60 to carrier 58 and carrier 58 to substrate 56 can be used, such as, glue and other adhesives. EAS element 60 can be, for example, a magnetic,
15 magnetic exhibiting a Barkhausen jump, radio frequency, and microwave element as is used in other EAS tags as is known in the art. Alternatively, EAS element 60 can be mounted directly on substrate 56 without carrier 58.

EAS label cartridge system 10 provides a means by which EAS labels 12 can be provided to a high speed application machine for source tagging. EAS label cartridge system
20 10 can be employed with either drop in applications where the electronic article surveillance label is placed inside the product or its packaging or where an adhesive is supplied to the label for application to the product or its packaging. In either case the combination of EAS labels 14 being at least semirigid and cartridge 12 maintaining the labels in the desired configuration provides a system that is readily adaptable to high speed application equipment.
25 EAS cartridge label system 10 facilitates and enhances the source tagging program currently being sought by retail chains and manufacturers.

It is to be understood that variations and modifications of the present invention can be made without departing from the scope of the invention. It is also to be understood that the scope of the invention is not to be interpreted as limited to the specific embodiments
30 disclosed herein, but only in accordance with the appended claims when read in light of the foregoing disclosure.

The claims defining the invention are as follows:

1. A cartridge for holding rectangular electronic article surveillance labels in a stack, said cartridge comprising:
 - a first side having an aperture so that the electronic article surveillance labels can
 - 5 be removed serially from said cartridge;
 - second and third straight sides that are sized to accommodate the largest dimension of the electronic article surveillance labels;
 - fourth and fifth straight sides that are sized to accommodate the second largest dimension of the electronic article surveillance labels; and
 - 10 a sixth side opposite said first side, said sixth side having an aperture, said second side contacting said fourth side to form a first interior angle, said second side contacting said fifth side to form a second interior angle, said third side contacting said fourth side to form a third interior angle and said third side contacting said fifth side to form a fourth interior angle, wherein one of said second, third, fourth, and fifth sides has a
 - 15 slot from said first side to said sixth side, thereby dividing the side having the slot into two pieces, and wherein at least one of said first, second, third, and fourth interior angles is greater than ninety degrees.
2. A cartridge for electronic article surveillance labels as recited in claim 1, wherein said second, third, fourth and fifth sides are sized so that the electronic article surveillance
- 20 labels in the stack fall out of said cartridge one after the other when said cartridge is positioned such that said first side is at the bottom of said cartridge.
3. A cartridge for electronic article surveillance labels as recited in claim 2, further comprising a cap sized to fit over said first side to hold the electronic article surveillance labels in said cartridge.
- 25 4. A cartridge for electronic article surveillance labels as recited in claim 3, further comprising caps sized to fit over said first and sixth sides to hold the electronic article surveillance labels in said cartridge.
5. A cartridge for electronic article surveillance labels as recited in claim 3, wherein said cartridge is made of plastic.
- 30 6. A cartridge for electronic article surveillance labels as recited in claim 1, wherein said aperture in said sixth side is about the size of the electronic article surveillance labels.
7. An electronic article surveillance label cartridge system as recited in claim 6, wherein all four sides of said first, second, third and fourth interior angles are greater than
- 35 ninety degrees.



8. An electronic article surveillance label cartridge system as recited in claim 1, wherein all four sides of said first, second, third and fourth interior angles are greater than ninety degrees.

9. An electronic article surveillance label cartridge system comprising: a plurality
5 of electronic article surveillance labels that are at least semirigid and a cartridge shaped to hold said electronic article surveillance labels in a stack, said cartridge having a first side with an aperture sized so that said electronic article surveillance labels can be removed serially from said cartridge, second and third sides that are sized to accommodate the
10 largest dimension of said electronic article surveillance labels, fourth and fifth sides that are sized to accommodate the second largest dimension of said electronic article surveillance labels and a sixth side opposite said first side, said sixth side having an aperture, said second side contacts said fourth side to form a first interior angle, said second side contacts said fifth side to form a second interior angle, said third side contacts said fourth side to form a third interior angle and said third side contacts said fifth side to
15 form a fourth interior angle, wherein one of said second, third, fourth, and fifth sides has a slot from said first side to said sixth side, thereby dividing the side having the slot into two pieces, and wherein at least one of said first, second, third, and fourth interior angles is greater than ninety degrees.

10. An electronic article surveillance label system as recited in claim 9, wherein all
20 four of said first, second, third and fourth interior angles are greater than ninety degrees.

11. An electronic article surveillance label cartridge system comprising: a plurality
of electronic article surveillance labels that are at least semirigid and a cartridge shaped to hold said electronic article surveillance labels in a stack, said cartridge having a first side with an aperture sized so that said electronic article surveillance labels can be removed
25 serially from said cartridge, second and third sides that are sized to accommodate the largest dimension of said electronic article surveillance labels, fourth and fifth sides that are sized to accommodate the second largest dimension of said electronic article surveillance labels so that said electronic article surveillance labels in said stack will fall out of said cartridge one after the other when said cartridge is positioned such that said
30 first side is at the bottom of said cartridge, and sixth side opposite said first side, said sixth side having an aperture, said second side contacts said fourth side to form a first interior angle, said second side contacts said fifth side to form a second interior angle, said third side contacts said fourth side to form a third interior angle and said third side contacts said fifth side to form a fourth interior angle, wherein one of said second, third, fourth, and fifth sides has a slot from said first side to said sixth side, thereby dividing the



side having the slot into two pieces, and wherein at least one of said first, second, third, and fourth interior angles is greater than ninety degrees.

12. An electronic article surveillance label cartridge system as recited in claim 11, wherein all four sides of said first, second, third and fourth interior angles are greater than
5 ninety degrees.

13. An electronic article surveillance label cartridge system as recited in claim 11, further comprising a cap sized to fit over said first side to hold said electronic article surveillance labels in said cartridge.

14. An electronic article surveillance label cartridge system as recited in claim 11,
10 further comprising caps sized to fit over said first and sixth sides to hold said electronic article surveillance labels in said cartridge.

15. An electronic article surveillance label cartridge system as recited in claim 11, wherein said cartridge is made of plastic.

16. An electronic article surveillance label cartridge system as recited in claim 11,
15 wherein said electronic article surveillance labels comprise an electronic article surveillance element attached to a substrate that is at least semirigid.

17. An electronic article surveillance label cartridge system as recited in claim 16, wherein said electronic article surveillance element is attached to a flexible substrate that is attached to said substrate that is at least semirigid.

20 18. An electronic article surveillance label cartridge system as recited in claim 11, wherein said electronic article surveillance labels comprise an electronic article surveillance element and a housing that is at least semirigid, said electronic article surveillance element being positioned inside said housing.

19. An electronic article surveillance label cartridge system as recited in claim 18,
25 wherein said electronic article surveillance element of said electronic article surveillance labels comprises a magnetic element.

20. An electronic article surveillance label cartridge system as recited in claim 19, wherein said magnetic element comprises a magnetomechanical marker.

21. A cartridge for holding rectangular electronic article surveillance labels in a
30 stack, said cartridge substantially as hereinbefore described with reference to Figs. 1-10 of the accompanying drawings.



22. An electronic article surveillance label cartridge system, said system substantially as hereinbefore described with reference to Figs. 1-10 of the accompanying drawings.

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DATED this Twenty-Seventh Day of November, 2000

Sensormatic Electronics Corporation

Patent Attorneys for the Applicant

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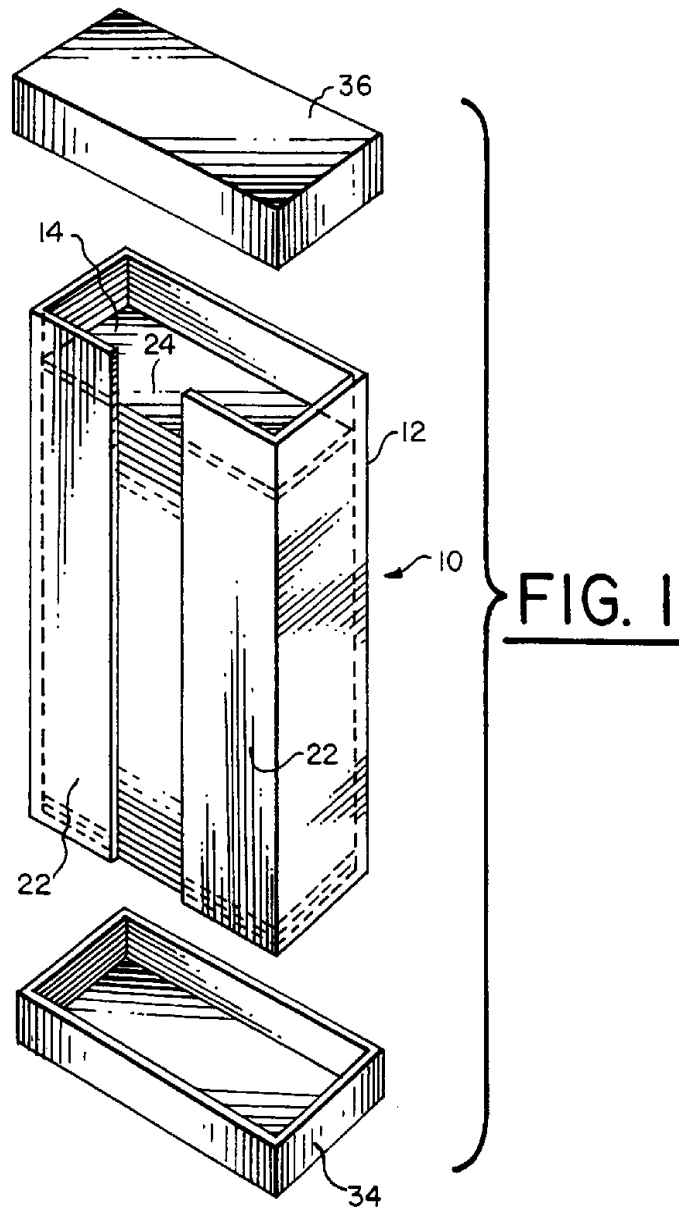


FIG. 2

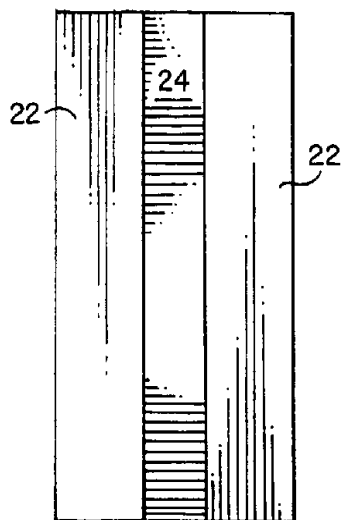


FIG. 3

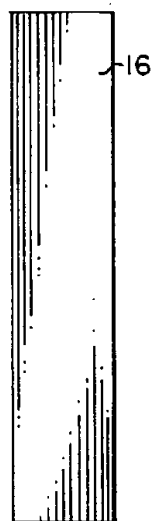
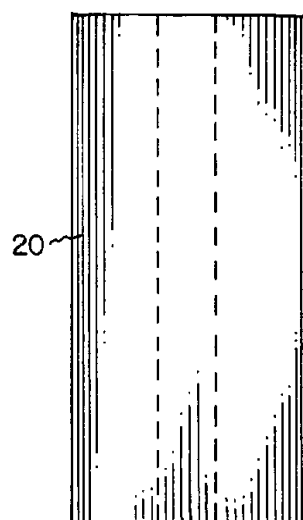


FIG. 4

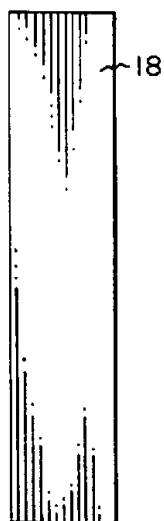


FIG. 5

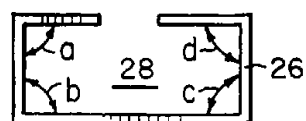


FIG. 6

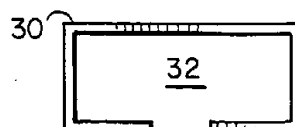


FIG. 7

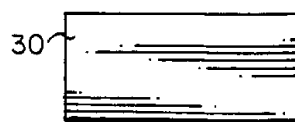


FIG. 8

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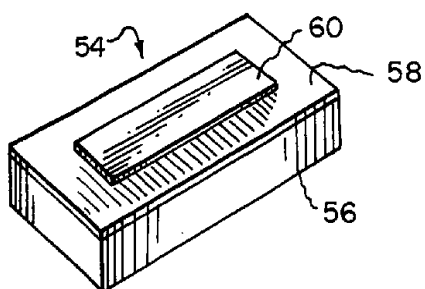
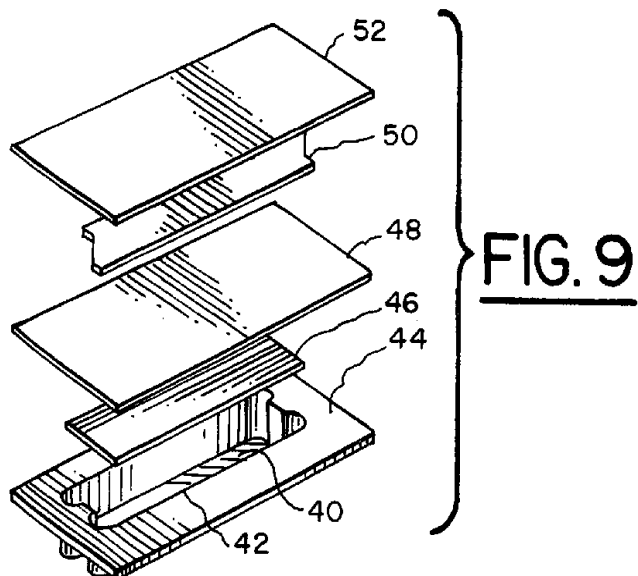


FIG. 10